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PICTURE OF THE MONTH

A Scalloped Squall Line

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Satellite photographs often reveal bright scalloped squall lines along the forward edge of frontal cloud bands. In this example, such a squall line moves out ahead of a large convective area in the Gulf of Mexico.

A large high-pressure area centered in Pennsylvania dominated the weather over the eastern half of the Nation on Aug. 14, 1970. A stationary front extended southwestward from a Low east of Virginia into the Gulf of Mexico. In the ATS 3 photograph (fig. 1) taken at 1650 GMT, the front (L–M) appears as a band of scattered convective clusters stretching southwestward. Surface reports across the Carolinas and Georgia showed little difference in the temperatures and dew points on either side of the front; and by 1800 GMT, the front was being "washed out" in the analysis.

Radar reports indicated that the convective cloud band began increasing westward across the Gulf of Mexico at 0600 GMT. By 1650 GMT, the most convective elements were located south of Louisiana at (N) in figure 1. A thin or clear area of clouds can be seen to the east of these clusters. A very bright thin line appears along the southern edge of the cluster. In figure 2 taken at 1939 GMT, the thin squall line (O) had separated from the main cloud area to the north, which had increased in size during this period. Radar reports show the cloud tops in the main area to be at 32,000 ft. The cloud line does not appear in the radar data, but earlier investigations (e.g., Environmental Science Services Administration 1967) of similar frontal band squall lines show that tops can range from 15,000 to 30,000 ft.

Motion pictures made from ATS satellite picture sequences suggest that these lines are produced by areas of intense convection. When convection ceases, the middle and high clouds dissipate, revealing the thin squall line that propagates away from the area and persists for a longer period. The scalloped appearance seen in figure 3 is typical of these lines. This squall line moved southeastward at 12 kt during the 5-hr interval shown here. By 2204 GMT, much of the line had diminished.

Also of interest is the large area of small fair-weather cumulus that covers most of the Southern and Eastern States in figure 1. In the subsequent views including figure 4, the smaller elements gradually disappear, leaving only a few thunderstorm clusters. On the other hand, the clouds about Cuba increase in size with time and by 2204 GMT cover much of the western part of the island.

REFERENCE

Environmental Science Services Administration, "Picture of the Month," *Monthly Weather Review*, Vol. 95, No. 2, Feb. 1967, p. 98.

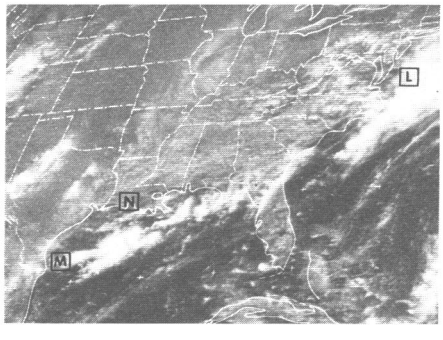

FIGURE 1.—ATS 3 view at 1650 GMT on Aug. 14, 1970.

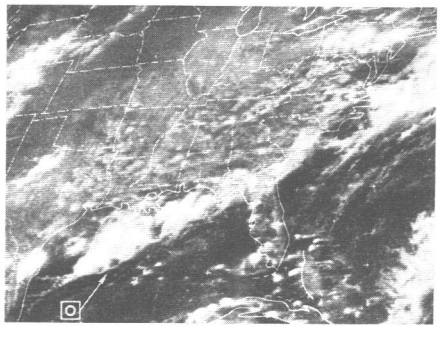

FIGURE 2.—ATS 3 view at 1939 GMT on Aug. 14, 1970.

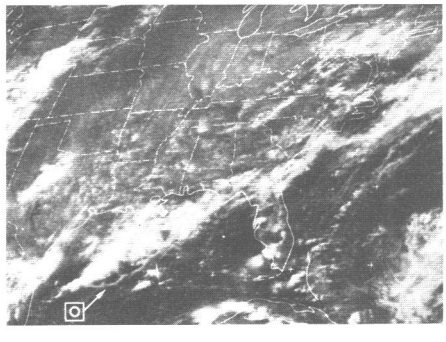

FIGURE 3.—ATS 3 view at 2051 GMT on Aug. 14, 1970.

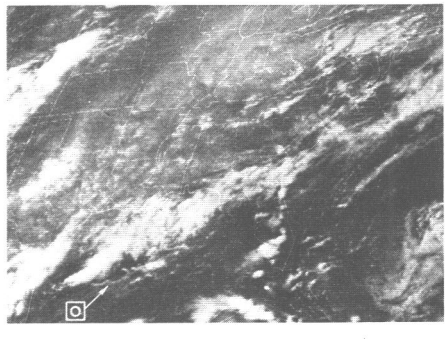

FIGURE 4.—ATS 3 view at 2204 GMT on Aug. 14, 1970.